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TIAJOLOFF & KELLY
CHRYSLER BUILDING, 37TH FLOOR
405 LEXINGTON AVENUE
NEW YORK, NY 10174

EXAMINER	
LAZORCIK, JASON L	

ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/502,500	BOGDAHN ET AL.	
	Examiner	Art Unit	
	Jason L. Lazorcik	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 21-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 21-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 and 9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the French Patent to Boscher (FR 2,767,810 – Please note the basis for the rejection is presented with reference to the English language translation from FLS, Inc.).

Broadly, Boscher teaches a method of drawing a glass ingot into a capillary having external and internal diameters of highly precise dimensions.

The method comprises first supplying said ingot to the heating zone of a furnace to heat soften the glass preform (Pg /6, lines 17-34). With particular reference to the following excerpt figure 2, Boscher discloses a "draw-off device" (2) for use in a vertical drawing method whereby a glass strand is drawn from the heat softened glass at a "controlled drawing speed". The draw-off device (2) comprises a "first draw-off unit" (4, 12)

including a "reference rolling body" (4) and "at least one auxiliary rolling body" (12) distributed about the circumference of the drawn glass strand (33).

The draw-off device (2) further comprises "at least one additional draw-off unit" (14, 16) including a plurality of rolling bodies (Claim 3). The plurality of rolling bodies (14, 16) are adapted to provide an adjustable contact pressure with a "means of pressure" (Pg /7, lines 20-29, and Pg /10, lines 5-19) or "a damper" (**Claim 9**) which is understood to be "movable in a direction perpendicular to the long axis of the glass strand" (**Claim 4, 6**).

FIG. 1

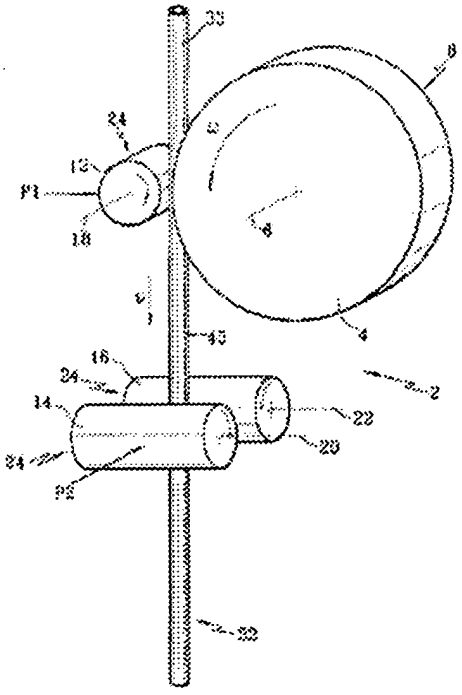
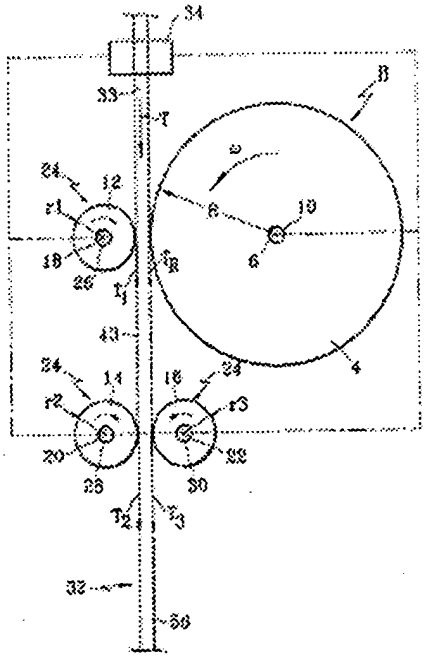


FIG. 2



The reference specifically teaches (Page /2, Lines 16-26) that "In this way the drive member (4)provides the rod with exactly the speed needed for the diameters to be produced. The moderate pressure exerted on the rod eliminates any risk of damaging the rod" and that "a relatively moderate pressure of the rod on the drive member allows one to obtain a rolling contact without any sliding of the rod on the drive member". Continuing, the instant reference discloses (Pg /7, lines 4-9) that "The mechanism 2 includes a speed servo control motor 10. This motor is equipped to impart to the wheel 4 rotational speed ω while keeping this speed constant even when the wheel 4 is subject to a variable strength torque. Such a motor is already known."

From the above teachings, it is understood that the drawing speed of the glass strand is "controlled" via the rotational speed of the reference rolling body (4) as claimed. Additionally, the drawing action is executed at a constant speed and "without any slip of the stem". Boscher further recognizes the effect of stress imparted to the upstream drawing process by a continually varying weight of the glass rod (Page /4, lines 18-32). It follows from the foregoing that "a value of torque of said reference rolling body" and "a contact pressure force" (**Claim 7**) are regulated at least in part with respect to "the weight of the drawn-off glass strand".

Boscher then discloses (pg /3, lines 20-22) that "Preferably, the drive member(4)and the traction member (12) are equipped to exert on the rod respective traction forces that are identical to one another." Here the machine translation of "tractive effort" is understood

to be equivalent to the claimed torque ("a traction TR = R *CR" see page 4, lines12-30), and from this it follows that the torque of the reference rolling body (4) is utilized as a target or "setpoint" for setting the torque value in the "at least one auxiliary rolling body" (12) (**Claim 2**).

Similarly, the reference teaches (Page /9, lines 24-32) that "One controls the four motors 10, 26, 28, 30 so that the linear speed of the cylindrical side of the drive wheel 4 and of the traction rollers 12, 14, 16 is equal to v...the three traction rollers 12, 14, 16 ... allow the wheel 4 to control the speed v of the tube 32 without disturbing this control". As with the auxiliary rolling body (12) it is here understood that the torque settings of the auxiliary rolling bodies (14, 16) are controlled with reference to the torque of the reference rolling body to maintain the vertical velocity of the glass strand (**Claim 5**)

To summarize, it is understood that Applicants claimed method of drawing glass requires the following three control conditions to be met:

1) Set the rotational speed of the reference body

2) Measure or determine a value correlated to the torque acting upon the reference body

3) Adjust the torque applied to the auxiliary rolling body in response to the measured value

The English language translation of the Boscher reference teaches on multiple occasions that the torque applied to the reference rolling bodies is controlled at a constant or "setpoint" value irrespective of the rotational speed of the rollers(pg13). Further, Boscher states that the rotational speed of the reference body and of the auxiliary bodies is controlled in response to at least one measured value, namely the diameter of the tube. The tube diameter is likewise correlated to the weight of the drawn glass and subsequently to the torque acting upon the reference body. Explicitly, Boscher states that

> "The mechanism includes some control devices adjusted so that the speed of the high speed motor 10 of the drive wheel 4 is under the control of a device 34 that measures the external diameter of the tube 32 upstream from the wheel 4. The three torque motors 26, 28, 30 of the rollers also have their speed controlled by this measurement device 34." (pg 15)

It is therefore evident that the Boscher device controls the Auxiliary body "setpoint" torque at least in response to the glass diameter and in response to the glass weight. Since the weight of the glass strand continually varies due to the downstream cutting operation, it follows that the Boscher device must continually vary the Auxiliary body torque in response thereto in order to maintain a "non-slip" contact.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boscher (FR 2,767,810) as applied under 35 U.S.C. 102(b)/103(a) to parent claims 3 and 7, respectively.

With respect to **Claim 8**, Boscher teaches that the contact pressure P1 of the first draw-off unit and in the second draw-off unit may each be selected to provide a contact between the rollers and the glass strand surface which does not slip during the drawing process (Page /10, lines 5-19). The reference is silent regarding the particular details

as recited in the instant claim wherein "when a predetermined maximum contact pressure force is exceeded" in the first draw off unit, the second draw off unit are engaged with the glass strand and/or the contact pressure force is increased between the glass strand and the second draw-off unit.

It is however the Examiners position, in the absence of any compelling and unexpected results to the contrary, that the claimed protocol for the engagement of pressing force upon the glass strand would have been a merely obvious extension over the prior art teachings of Boscher. Specifically, it would have been obvious for one of ordinary skill to seek to minimize marring of the drawn strand by minimizing both the amount and degree of physical contact with the apparatus. To this end, the claimed sequential engagement protocol for the first and second draw-off units would have presented a merely obvious alternative to the explicit prior art disclosure for one of ordinary skill seeking to minimize the potential for surface marring of the glass strand.

Claims 10, 11, and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boscher (FR 2,767,810) as respectively applied to claims 1-8 above, and further in view of the W. Haldenwanger company ceramic roller product brochure (Publicly available; August 19, 2000) and the NIST materials property data summary for sintered silicon carbide.

Boscher teaches that the reference roller (4) is At least partially "made out of a hard material such as steel" and that "coefficient of friction of the body of drive on the stem is low". Additionally in a preferred embodiment the reference teaches that "The three rollers of traction 12, 14, 16 having a cylindrical face 24 less hard than wheel 4". Although the reference teaches that the auxiliary rollers should have a higher coefficient of friction than the reference roller, Boscher does explicitly limit the coefficient of friction of the roller surface as set forth in Claim 10, 21,23,25,27 nor does the reference explicitly disclose the use of a roller surface containing asbestos, asbestos substitutes, or SiC as per Claims 11,22, 24,26,28.

Although Boscher does not explicitly teach the use of silicon carbide rollers for the instant application, such rollers were commercially available on the open market from at least the W. Haldenwanger company (http://web.archive.org/web/20001118093500/www.haldenwanger.de/index2.cfm?rubrik=Halsic-R/Halsic-I) at the time of the invention. Specifically the product brochure for the Halsic brand silicon carbide industrial rollers indicate (See English Language Equivalent Brochure) that the rollers share the following characteristics: "absolute dimensional stability despite extreme mechanical strain in high temperature applications – very good thermal shock resistance – excellent corrosion resistance – and low specific weight" (Pg 2, first paragraph). One having no more than an ordinary level of skill in the art at the time of the invention would have recognized the benefits of applying the heat resistant Halsic brand rollers in the elevated temperature Boscher glass drawing process.

Specifically, it would have been obvious to on of ordinary skill to implement the commercially available rollers in the Boscher apparatus when seeking to maximize useful roller lifetime (**Claims 11,22, 24,26,28**).

A property summary provided by NIST for sintered Silicon Carbide of the general type utilized in the Haldenwanger rollers (http://www.ceramics.nist.gov/srd/summary/scdscs.htm) further reveals that such rollers would reasonably be expected to present a coefficient of friction in the range of 0.4 to 0.7 which clearly overlaps the claimed range of 0.2 to 0.5 (**Claim 10, 21,23,25,27**).

Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boscher (FR 2,767,810) in view of the ordinary level of skill in the art at the time of the invention.

As set forth in the rejection of claims under 35 U.S.C.102(b)/103(a) above, Boscher teaches a method of drawing a cylindrical glass body. The prior art discloses essentially every element of Applicants claimed invention including the claimed heating zone, drawing device with reference rolling body and auxiliary rolling bodies which engage the glass body.

Boscher teaches that the reference rolling body is controlled by a constant speed motor which is responsive to the diameter of the glass rod. Since the diameter of the rod is dependent upon a continually varying weight of the glass rod and since one objective of the Boscher process is a constant diameter product, it follows that Boscher

controls the refernce body speed in response to at least the diameter and/or weight of the glass rod.

Boscher next teaches that the auxiliary bodies are controlled to maintain a constant torque upon the glass body and thereby provide a non-slip contact between the drawing device and the glass rod. As with the speed of the reference rolling body, the value of torque required to maintain the non-slip contact is expected to vary with the weight and diameter of the drawn glass rod. The reference further teaches that the Auxiliary bodies are controlled to maintain a constant applied torque value in response to a varying speed of the reference body, in response to a varying weight of the drawn glass rod, and in response the diameter of the glass rod.

The reference does not make explicit the particular details of the control algorithm as presently claimed by Applicant. Specifically, Boscher is silent regarding determining a setpoint drawing speed (input N), determining "a reference torque value" applied to the reference rolling body, determining an auxiliary rolling body torque value" applied to the aulixiary rolling body, determining a correction value (signal K) by comparing the reference and auxilary torque values, and applying the input N and signal K values to adjust the torque applied to the auxiliary rolling body.

Although the instant reference does not make explicit the above limitations, it is the Examiners position that such a control algorithm would have represented a minor and trivial extension over the Boscher teachings for one of ordinary skill in the art at the time of the invention. The Boscher reference impicitly teaches the use of such a control architecture by stating that the auxiliary body maintain a controlled torque upon the

glass surface irrespective of the speed of the reference rolling body. The details of applying such a control algorithm, specifically as presently claimed by Applicant, would have presented a trivial extension over the prior art teachings for one of ordinary skill in the arts.

Response to Arguments

With respect to the rejection of claims under 35 U.S.C 102(b) and/or 103(a), Applicant argues that the prior art method is distinguished over the method of producing a cylindrical glass body disclosed in the cited reference to Boscher et. al. (FR 2,767,810). Pointing to excerpts from pending specification, Applicant argues broadly that prior art methods for producing glass bodies results in bent and damaged glass bodies.

Turning specifically to the prior art reference, Applicant alleges that Boscher teaches that the drawing body is driven at a constant speed while the auxiliary rollers are operated to maintain a constant torque. Applicant then acknowledges that Boscher teaches regulating the applied torque as a function of the weight of the drawn-off glass but argues that Boscher does not teach the specifically claimed method of controlling the torque applied by the reference body. Specifically, Applicant argues that Boscher does not teach determining a value which is correlated to the torque acting on the reference body and using this correlated value to adjust the actual torque applied to the reference body.

Applicants arguements are held to be unpersuasive.

As discussed in the rejection of claims above, Boscher teaches that both the speed and torque of the reference rolling the auxiliary bodies is responsive to the diameter/weight of the drawn body.

> "The mechanism includes some control devices adjusted so that the speed of the high speed motor 10 of the drive wheel 4 is under the control of a device 34 that measures the external diameter of the tube 32 upstream from the wheel 4. The three torque motors 26, 28, 30 of the rollers also have their speed controlled by this measurement device 34." (pg 15)

Boscher further teaches that the value of torque applied by each auxiliary roller is controlled to have the same strength values.

> "In addition, the control devices control the motors 10, 26, 28, 30 so that T_R and T_1 have the same strength, and that T_2 and T_3 have the same strength." (pg 16)

It is evident from the foregoing prior art translation excerpts that Boscher in fact does provide for control over both the speed and the applied torque of the auxiliary bodies. This control is exacted in response to a measured value which is correlated to said torque.

Although Applicant argues a distinction between the prior art process and that presently claimed, no such patentable distinction has been recognized by the Examiner. The Boscher method is understood to utilize a substantially identical apparatus under the control of a substantially identical control algorithm to produce a substantially identical product.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL

Primary Examiner